The Relation of Motor Development and Self-Efficacy in Young Children

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Abstract

The purpose of the present study was to examine the relationship between motor skills and social development in young children. Subjects were 24 children in a nursery school who participated in the Miyagi Kids Program for soccer. The program was conducted four times in the year. The present study focused on the results in November 2013 and March 2014.

The main results are as follows: (1) The self-evaluations of the soccer activities decreased from November to March. (2) The self-efficacy score was pretty high for "sport," "friends," and "study." (3) "Self-evaluation of the soccer game" was significantly correlated with "self-efficacy for motor skills." (4) "Self-evaluation of whole activities" was significantly correlated with "self-efficacy for friends" and "self-efficacy for studies."

Key words: motor development, self-efficacy, soccer, young children

The authors have been involved in the Miyagi Kids Program for several years (Hongo et al., 2006; Hongo et al., 2009). The Miyagi Kids Program is a soccer coaching program which is conducted by the Miyagi Football Association. The purpose of this program is to provide children with a fun experience of playing soccer and promote the healthy development of children. Through our association with the Miyagi Football Association, we have examined three research questions: (1) how basic motor skills develop, (2) how children's participation in the program changes with motor development, and (3) how changes in motor skills influence children's self-efficacy (Hongo, 2014).

Through our involvement with this program, we realized that many children with special care needs have some difficulties with their motor development. In this study, we defined "children with special care needs" as a child with no diagnosis of a neurodevelopmental disorder, but demonstrating problems, such as difficulties with interpersonal relationships, hyper activity, and low adaptability. Some children with special care needs, experience difficulties with motor control or motor regulation and consequently, they tend to have a low self-efficacy. Moreover, this tendency affects children's social development, such as peer relations. Therefore, we planned to promote both the motor development and social development of children through this program.

There is very little research about the relation between motor development and social development. However, Yoshida et al. (1994) examined how a one-year experience with soccer class affected the mental development of 5-year old children. The results showed that there was a significant difference between children who participated in the soccer class and those who did not. Children who participated in the soccer class had a higher "self-efficacy for ball control skills." The study also reported that there was no significant difference between the experimental group and control group with respect to their "social development in a play situation." However, the results from our previous studies suggested that the soccer coaching program promoted children' s motor development as well as their motivation, comprehension of rules, and parent-child relationship (Hongo et al., 2006).

Following from the above-mentioned points and results of previous studies, the purpose of the present study was to examine the inter relationship among (1) motor development, (2) self-efficacy for motor skills, and (3) self-efficacy for daily life in young children.

Method

1. Participants: Participants included twenty-four 5-year old children in a nursery school (14 boys, 10 girls). Prior to the program, they were separated into four groups based on their age.

2. Investigation Period: The program was carried out four times in a year for approximately one hour pre session. Three coaches from the Miyagi Football Association supervised the program. We analyzed the data from November 2013 and March 2014.

3. Program: There were three kinds of activities [(1) ～ (3)] and two kinds of rating tasks[(4) ～ (5)]:

(1) "Beads Relay" activity: Children ran through the course, put ten beads through the string, and returned to the course (Figure 1).

(2) "Shoot" activity: They practiced the shoot towards the goal several times.

(3) "Soccer Game" activity: They played two games using a ball (2 minutes per game).

(4) Self-evaluation for the three kinds of activities: We asked children to rate their self-efficacy for the kinds of activities carried out in the program and the whole soccer program (whole

activity).

(5) Rating self-efficacy for aspects of everyday life: We asked children to rate their self-efficacy for 3 kinds of areas of everyday life (sports, friends, and studies).

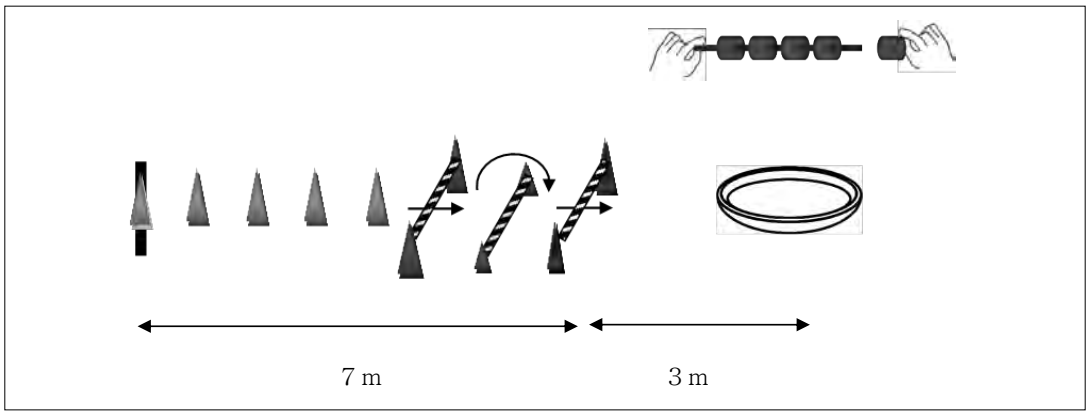

Figure 1 Beads relay

* The interval between the cones is 1m.
* The height of the first and third bar is 60 cm and that of the second bar is 26cm.

4. Self-evaluation of the activity and self-efficacy:

We used an application (Turning Point 2008) made by Keepad Japan for the self-evaluation of the activity and self-efficacy. Turning Point is a wireless voting system through which participants can evaluate things in real time, which allows us to collect a lot of data at once using "clickers" (Figure 2).

The procedure for using Turning Point was as follows:

(1) Confirmation of the Operation

At first, children practiced how to use the "clickers" so that they could use them correctly. If some children couldn't understand the procedure, the experimenter helped them.

The experimenter repeated the following instructions: 1) do not say the answer aloud, 2) do not talk to a friend, and 3) do not push the button before the presenter says "please push the button."

(2) Self-evaluation of the activity

Children were asked to evaluate the three kinds of activities and the whole activity. The rating was done on 4-point- scale. For the rating of the "beads relay," "shoot," and "soccer game" activities, children were asked to choose one of the response options that ranged from "very good" to "not good" (Figure 3). For the rating of the whole activity, children were asked to choose one of the response options that ranged from "very fun" to "not fun".

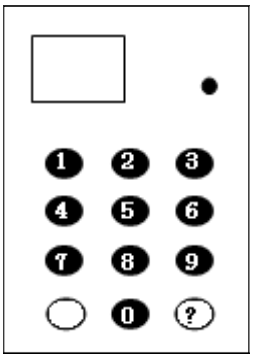

Figure 2　Clicker

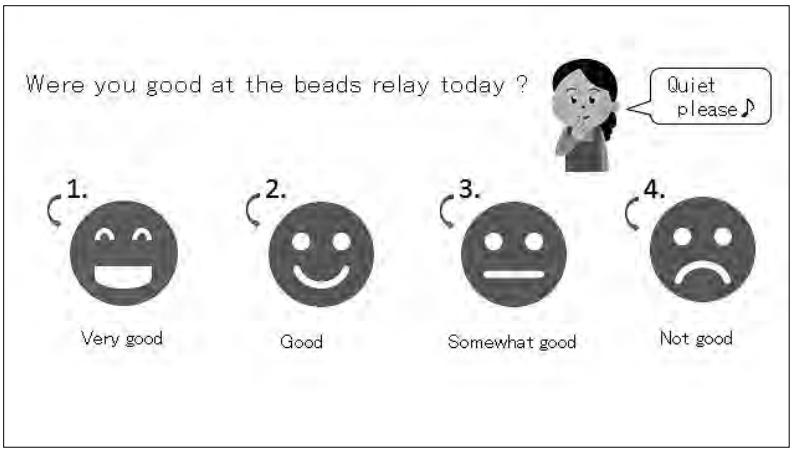

Figure 3　The self-evaluation of the activity (beads relay)

(3)　The rating of self-efficacy

Children were asked to evaluate their self-efficacy for three kinds of areas of everyday life (sports, friends, and studies) using a 4-point rating scale. For the rating of self-efficacy, children were asked to choose one of the response options that ranged from “very good” to “not good” (Figure 4).

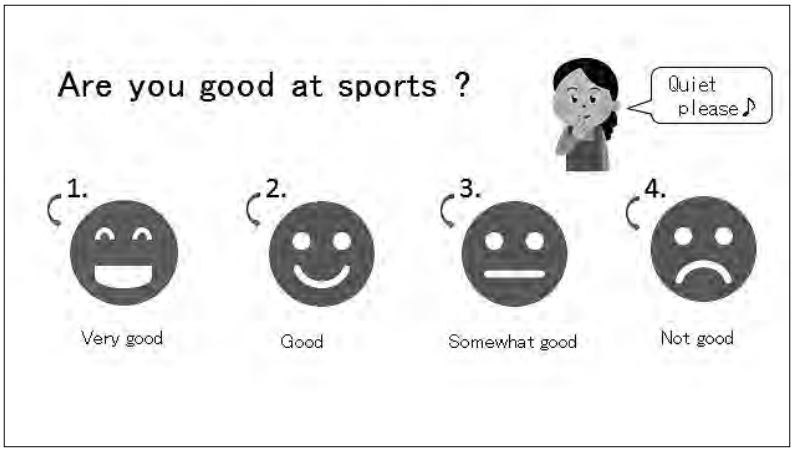

Figure 4　The rating of self-efficacy (sports)

Results

1. Motor Development

We used the mean time of the beads relay as an index of motor development. We analyzed data from eighteen children (12 boys, 6 girls) that were collected in November 2013 and March 2014.

The mean time was 76.22 seconds (SD= 20.74) in November, 2013, and 68.67 seconds (SD= 25.84) in March 2014 (Figure 5). We used a t-test to compare the difference between the mean time score at the two different points of time. The results indicated no significant difference between these two points of time (t (17) = 1.18, n. s.).

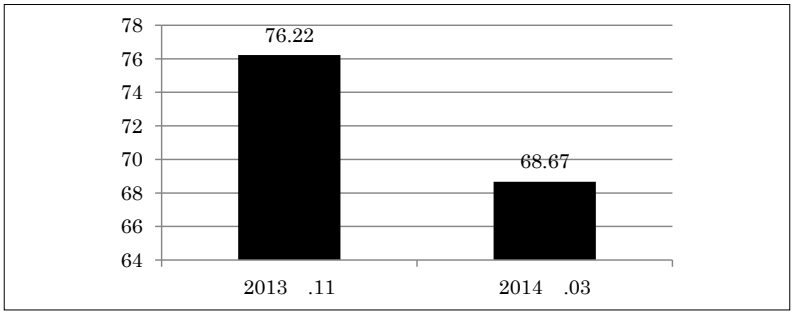

Figure 5 The mean time of beads relay (n=18)

2. Self-evaluation

In the analysis, we used data from eighteen children (12 boys, 6 girls) collected in November 2013 and March 2014. We scored the ratings in the following manner: 4 points to “very good,” 3 points to “good,” 2 points to “somewhat good,” and 1 point to “not good.”

We used a t-test to compare the self-evaluation scores of the soccer activities at the two different points of time. The results showed that the total score of the ratings in March was significantly lower than the total score of the rating in November (t (17) = 2.54, $p < .05$). Moreover, there were significant differences in the scores for the beads relay and soccer game activities. There were significant differences between the scores in November and the scores in March (beads relay: t (17) = 2.61, $p < .05$; soccer game: t (17) = 2.37, $p < .05$) (Table 1).

Table 1 t-test of Self-evaluation of Activity (n=18)

	2013.11 mean (SD)	2014.3 mean (SD)	t-test
Beads	3.78 (0.43)	3.11 (0.96)	t(17)=2.61, p<.05
Shoot	3.56 (0.86)	3.67 (0.59)	t(17)=-0.46, n.s.
Game	3.50 (0.71)	2.89 (1.28)	t(17)=2.37, p<.05
Soccer Project	3.61 (0.61)	3.72 (0.57)	t(17)=-1.00, n.s.
Whole Activity	14.44 (1.85)	13.39 (2.50)	t(17)=2.54, p<.05

3. Self-efficacy

We measured the self-efficacy for “sports,” “friends,” and “studies” in March 2014. The data was were collected from twenty-one children (14 boys, 7 girls).We scored the ratings in the

following manner: 4 points to “very good,” 3 points to “good,” 2 points to “somewhat good,” and 1 point to “Not good.” The results are shown in Table 2.

Table 2 Mean and SD of Self-efficacy (n=21)

Sports	Friends	Study
3.38 (0.74)	3.71 (0.46)	3.43 (0.81)

4. The relation between self-evaluation and self-efficacy

In the analysis, we used the data twenty children (14 boys, 7 girls) in March 2014.

We calculated the correlation coefficients for the four kinds of self-evaluation (beads relay, shoot, soccer game, whole soccer program) and the three self-efficacy areas (sports, friends, and studies).

A significant correlation was found between the “self-evaluation of the soccer game” and the “self-efficacy for sports” (r=.510), the “self-evaluation of the whole soccer program” and “self-efficacy for friends” (r=.515), and the “self-evaluation of the whole soccer program” and “self-efficacy for studies” (r=.474). The results are shown in Table 3.

Table 3 The correlation between self-evaluation and self-efficacy (n=21)

	Beads	Shoot	Game	Soccer Project	Sports	Friends	Study
Beads	1	0.15	0.39	0.41	0.22	0.28	0.19
Shoot	0.15	1	.464*	0.21	0.20	0.00	0.11
Game	0.39	.464*	1	0.43	.510*	0.32	-0.03
SoccerProject	0.41	0.21	0.43	1	0.24	.515*	.474*
Sports	0.22	0.20	.510*	0.24	1	.480*	0.21
Friends	0.28	0.00	0.32	.515*	.480*	1	.609**
Study	0.19	0.11	-0.03	.474*	0.21	.609**	1

*p<.05, **p<.01

Discussion

The purpose of the present study was to investigate the relation between motor skills and social development in early childhood. Specifically, this study was conducted with 24 five year old preschoolers and examined the relationship between their performance on motor skill tasks, self-evaluation of the motor skill tasks, and self-evaluation of their self-efficacy.

Motor Development

In this study, there was no significant difference found between the mean time taken for the beads relay in November and March. We can assume that this is because the interval between

the two points of time was relatively short and therefore, it was impossible to measure the motor development in this short period. However, 14 out of the 18 preschoolers' time taken for the performance of the tasks decreased. Therefore, by extending the interval, we assume that we can measure the development of the motor skills of preschoolers.

Self-evaluation

Although there was no difference in the soccer activities, the results showed that the total scores, of the beads relay and the soccer game decreased significantly from November to March. We could think of two reasons to explain this result. Firstly, this could have been promoted by the rapid cognitive development that occurs in early childhood. At this age, preschoolers begin to develop self-monitoring skills and realize the gap between their ideal self-ability and real self-ability. Thus, even though there is an actual development in their motor skill, children may negatively evaluate their own skills. Secondly, children's understanding of others also develops at this age. With this improvement in the understanding of others, children begin to compare their own ability with that of other children. By doing this, they might evaluate their ability negatively or label it as inferior compared to other children.

Self-efficacy

We measured the preschoolers' self-efficacy for "sports," "friends," and "study." The mean self-efficacy score for "sports" was 3.38, the score for "friends" was 3.71, and the mean score for "studies" was 3.43. Overall, the self-efficacy scores were high and we suggested that children tend to evaluate their own self-efficacy relatively high in early childhood. Compared to school-age children, preschool children have few opportunities to compare their own ability to those of other children. Additionally, they tend to get more praise from their teachers at this age. As a result of these factors, we can assume that preschoolers perceive their own ability as high and may think they are well-adapted to meet the needs of their daily life. Although typical preschoolers have a high self-efficacy, children with special care needs have a low self-efficacy, since children tend to compare their own motor skills with those of others at this age. This indicates the need for future studies to recognize and focus on the self-efficacy of children with special care needs.

The relation between motor skill and self-efficacy

The results showed that "self-evaluation of the soccer game" was positively correlated with "self-efficacy for motor skills." Moreover, "self-evaluation of the whole activity" was positively correlated with "self-efficacy for friends" and "self-efficacy for studies". These results suggested that preschoolers' self-evaluation of their own motor skill influenced their self-efficacy for all three

areas, i.e., motor skills, friends, and studies. However, the results showed that the influence of self-evaluation on self-efficacy was not consistent in early childhood. Therefore, it is necessary for future research to examine the inter relationship between motor skills, the understanding of the self, and the understanding of others.

Finally, we collected data in this study using "clicker." This enabled us to collect the data of 24 children all at once, in a short period of time. The subjects of the present study were young children and, they could use the "clicker" without much confusion. It is therefore, a very convenient and useful method for data collection

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